AOARD REPORT

Systems Engineering Research Institute (SERI)

29 June 94

T. Davis
AOARD

The Systems Engineering Research Institute (SERI), located about 120 miles south of Seoul in the Taedok Science Town at Taejon, is South Korea's premier computer and systems science R&D facility. It is the primary instrument by which the Korean government implements the country's national strategic computer systems and software R&D program and is also the hub of Korea's supercomputing activities and the central operating facility for the Korea Research Environment Open Network (KREONET). This report describes a visit to SERI by AOARD scientists on 29 June, 1994.

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The AFOSR/AOARD visit to the Systems Engineering Research Institute (SERI) took place on Wednesday morning, 29 June. AOARD was represented by Drs. Yakura and Davis. The Korean hosts for the visit were Dr. Moon Hyun Kim, President of SERI, and Mr. Hong-Ki Kim and Mr. Chan Soo Hwang, both representing the International Cooperation and P. R. Section. The hosts' contact information is as follows.

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The Systems Engineering Research Institute (SERI) headquarters and virtually all of its activities are located in the Taedok Science City at Taejon (or alternatively, Daejon), Korea, about 120 miles south of Seoul. SERI is Korea's premier computer and systems science R&D facility, and it is the primary instrument by which the Korean government implements the country's national strategic computer systems and software R&D program. SERI is responsible for providing computer systems R&D support to Korean industry, academia and other government research organizations, and additionally serves as the implementing organization for Korea's national software development education and training program. It is also the hub of Korea's supercomputing activities and the central operating facility for the Korea Research Environment Open Network (KREONET), both of which are briefly reviewed below.

SERI traces its origin back to June, 1967 when the Computation Research Lab (CRL) of the Seoul based Korea Institute of Science and Technology (KIST) was established. (A separate KIST visit report appears elsewhere in this newsletter). At that time, the CRL's mission was limited to providing computer services in support of KIST's R&D program. In April, 1977, CRL was renamed the Software Development Center (SDC), and its charter expanded from a

computer services center to include its own computer software R&D program. In 1981, KIST merged with the Korean Advanced Institute of Science (KAIS), a graduate school of applied science and engineering, and the organizations were collectively renamed the Korean Advanced Institute of Science and Technology (KAIST). (As with KIST, a separate KAIST visit report appears elsewhere in this newsletter). In the aftermath of this merger, the Software Development Center was reorganized as a research affiliate of KAIST, and in November, 1984 assumed its current name, the Systems Engineering Research Institute (SERI). In June, 1989, KIST was reborn as a separate research institute and SERI's affiliation was changed from KAIST to KIST. In May, 1990, SERI moved from Seoul to Taejon and occupied a new facility in the Taedok Science City, its current location.

SERI's current organization consists of a president (Dr. Moon Hyun Kim), a Senior Director, five R&D divisions, two service centers and three departments. The R&D Divisions are named Artificial Intelligence, Software Engineering and System Software, Global Environmental Information, System Application and Integrated Production Systems, and have corresponding R&D program thrusts. The two service centers are the Information Technology Education Center and the Supercomputer Center. The three departments are devoted to Technology Policy, Planning & Project Management, and Administration respectively.

The R&D programs of SERI's five R&D directorates collectively span a typical array of computer systems and software development activities. Particularly noteworthy program thrusts, indicative of SERI's role as Korea's instrument for implementing its national strategic computer systems policy, are substantial efforts in Korean language processing (including automatic translation to and from English, Japanese and German, as well as Korean language management information and educational software systems), a major effort in software for production management and automated manufacturing, and a Korean language software engineering environment development effort. The Information Technology Education Center, which provides a full array of semester length software development training courses (including instructor training courses) to some 4000-5000 industry, academia and government agency students each year, is also clearly related to national policy objectives.

As noted earlier, SERI is also the key element of Korea's national supercomputing and network activities. The operational focus of both is the Supercomputer Center. SERI obtained its first high performance computing machine, a CDC3300, in 1969. Several CDC model upgrades, including a Cyber960, were implemented over the ensuing years and in 1988, a Cray 2S was obtained. The latter was upgraded in 1993 to the current Cray Y-MP C916/16512 configuration. The supercomputing center operates full time and is available to Korean academic, industrial and government users. The services are made available virtually free of charge (a nominal registration fee only) to academic institutions.

SERI operates the hub facility of the Korea Research Environment Open Network (KREONET) from the Supercomputer Center. Services available on KREONET include file transfer, e-mail, remote login, data base access and network news. The system links eight nodes inside Korea, including 2 T1 links

to Seoul) and provides 56Kbit/s access to the Internet via the San Diego Supercomputer Center.

SERI is staffed by about 400 full time and 50 part time employees. About 250 staff members are scientists, of which some 35 are Ph. D. The staff is exceptionally young, typically two to three years or less since graduation. The 50 part time employees are almost entirely graduate students in the Department of Computer Science at the Korea Advanced Institute of Science and Technology (KAIST), which is also located in the Taedok Science City.

SERI's FY93 budget totaled about US$35M. Of that amount, about US$25M in direct support was provided by the Korean government. The remaining US$10M was derived via R&D contracts with Korean industrial sponsors and government agencies.